

one-half of industry capacity.<sup>33</sup> The significant reduction in the HHI that will accompany the introduction of PCS and ESMR can be expected to increase industry competitiveness.

Ignoring ESMR for the moment and concentrating solely on PCS, the "worst," i.e., most concentrated, case, occurs where each of three newcomers acquires licenses to use both a 30 MHz and a 10 MHz assignment, the maximum bandwidth that can be acquired under FCC rules. Even in this case, the HHI declines by more than half to 2278.<sup>34</sup> Significantly, the cellular carriers each have only about 11 percent of industry capacity while each of the newcomers has more than 26 percent.

In the "best," i.e., least concentrated, case, three new licensees each have a 30 MHz allocation and three new licensees each have a 10 MHz allocation. In these circumstances, the HHI is 1514, less than one-third of what it had previously been<sup>35</sup>, with the cellular carriers again each having only an 11 percent share.

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<sup>33</sup>The HHI is calculated as  $2(50)^2$ , since each of the two cellular suppliers is licensed to use 50 percent of industry capacity. In this calculation, we ignore the presence of other suppliers of mobile services, which has the effect of increasing the HHI.

<sup>34</sup>This assumes that digital capacity has 6 times the throughput as analog and that the incumbent cellular carriers must reserve 10 MHz to service customers using analog equipment. The details of this and the following calculations are presented in Tables 1 and 2. D.P. Reed, Putting It All Together: The Cost Structure of Personal Communications Services (Federal Communications Commission, Office of Plans and Policy, November 1992, pp. 66-69) provides references to many of the estimates of the advantages of digital over analog transmission.

<sup>35</sup>Actually, concentration can be less than this if the initial PCS licenses are subdivided. The calculations presented here are conservative in that they assume no subdivision occurs.

Indeed, even if a cellular carrier were to acquire a 10 MHz allocation, the maximum it can obtain, its share would rise to somewhat less than 18 percent, which would still be smaller than the share of each of the three newcomers with a 30 MHz allocation.<sup>36</sup>

When ESMR is taken into account, the market becomes even less concentrated. If the ESMR is assigned a bandwidth of 10 MHz, the worst case HHI is 2045 and the best case HHI is only 1370. Here, the share of an incumbent cellular carrier is reduced to only about 10 percent if it does not acquire a 10 MHz license, and it is somewhat less than 17 percent if it does. By contrast, a PCS newcomer with a 30 MHz license has a share of more than 18 percent, while one with both a 30 MHz and a 10 MHz license has a share of more than 24 percent.

These calculations strongly support two conclusions. First, overall industry concentration will decline greatly as the result of the introduction of PCS and ESMR, with the precise extent determined by the identities of the successful bidders in the PCS auctions and on transactions in the aftermarket. In no case does the HHI fall by less than half, and it could decline by more than two-thirds. Second, the shares of the incumbent cellular operators, as measured by their shares of effective capacity, will

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<sup>36</sup>The reason, as mentioned, is the continuing analog obligation.

decline precipitously with the introduction of PCS and ESMR.<sup>37</sup>

### Conclusion

We are about to enter a new era in which the number of firms supplying mobile telecommunications services will more than double, effective industry capacity will increase more than fourfold, measured industry concentration will decline by more than half, and the share of the effective capacity of the industry licensed to each of the two current cellular providers will decline by more than two-thirds. As the number of carriers increases, and industry concentration as measured by the HHI declines, the industry is likely to become more competitive. Given the quite remarkable performance of the cellular industry with only two carriers and much more limited capacity, the future of the mobile services industry is likely to be especially bright, with firms offering a wide array of new services and even lower prices than in the past for existing ones. In these circumstances, the best approach for regulators is to eliminate regulatory-imposed barriers to entry as rapidly as possible so that competitive market forces can determine the performance of the industry. Regulators would be at odds with developing market forces if they were to impose more stringent

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<sup>37</sup>We do not mean to suggest that the newcomers share of output will increase as rapidly as will their share of capacity. The point is, rather, that the existence of this large amount of capacity will immediately serve to discipline the pricing behavior of the incumbent cellular operators. The behavior of their output shares will depend in part on how they adjust their prices to the new entry. It should also be emphasized here that prices will likely fall simply because of the large increase in capacity.

requirements on cellular carriers just as industry concentration is declining so dramatically.

**Table 1**

**HHI Calculations Without ESMR**

Digital : Analog / 6 : 1

Cellular Operators' Bandwidth Devoted to Analog : 10 MHz

| Firms         | Bandwidth  | Effective Capacity* | Market Share | HHI Contribution | Bandwidth  | Effective Capacity* | Market Share | HHI Contribution |
|---------------|------------|---------------------|--------------|------------------|------------|---------------------|--------------|------------------|
| Cellular 1    | 25         | 100                 | 10.9%        | 118              | 25         | 100                 | 10.9%        | 118              |
| Cellular 2    | 25         | 100                 | 10.9%        | 118              | 25         | 100                 | 10.9%        | 118              |
| 3             | 30         | 180                 | 19.6%        | 383              | 40         | 240                 | 26.1%        | 681              |
| 4             | 30         | 180                 | 19.6%        | 383              | 40         | 240                 | 26.1%        | 681              |
| 5             | 30         | 180                 | 19.6%        | 383              | 40         | 240                 | 26.1%        | 681              |
| 6             | 10         | 60                  | 6.5%         | 43               | 0          | 0                   | 0.0%         | 0                |
| 7             | 10         | 60                  | 6.5%         | 43               | 0          | 0                   | 0.0%         | 0                |
| 8             | 10         | 60                  | 6.5%         | 43               | 0          | 0                   | 0.0%         | 0                |
| <b>Totals</b> | <b>170</b> | <b>920</b>          |              | <b>1,512</b>     | <b>170</b> | <b>920</b>          |              | <b>2,278</b>     |

\* Effective Capacity is defined as bandwidth devoted to digital multiplied by the ratio of digital's advantage over analog plus bandwidth devoted to analog.

SOURCES: FCC, Second Report and Order; Charles River Associates.

**Table 2**

**HHI Calculations With ESMR**

**Digital : Analog / 6 : 1**

**Cellular Operators' Bandwidth Devoted to Analog : 10 MHz**

| Firms         | Bandwidth  | Effective Capacity* | Market Share | HHI Contribution | Bandwidth  | Effective Capacity* | Market Share | HHI Contribution |
|---------------|------------|---------------------|--------------|------------------|------------|---------------------|--------------|------------------|
| Cellular 1    | 25         | 100                 | 10.2%        | 104              | 25         | 100                 | 10.2%        | 104              |
| Cellular 2    | 25         | 100                 | 10.2%        | 104              | 25         | 100                 | 10.2%        | 104              |
| 3             | 30         | 180                 | 18.4%        | 337              | 40         | 240                 | 24.5%        | 600              |
| 4             | 30         | 180                 | 18.4%        | 337              | 40         | 240                 | 24.5%        | 600              |
| 5             | 30         | 180                 | 18.4%        | 337              | 40         | 240                 | 24.5%        | 600              |
| 6             | 10         | 60                  | 6.1%         | 37               | 0          | 0                   | 0.0%         | 0                |
| 7             | 10         | 60                  | 6.1%         | 37               | 0          | 0                   | 0.0%         | 0                |
| 8             | 10         | 60                  | 6.1%         | 37               | 0          | 0                   | 0.0%         | 0                |
| ESMR 1        | 10         | 60                  | 6.1%         | 37               | 10         | 60                  | 6.1%         | 37               |
| <b>Totals</b> | <b>180</b> | <b>980</b>          |              | <b>1,370</b>     | <b>180</b> | <b>980</b>          |              | <b>2,045</b>     |

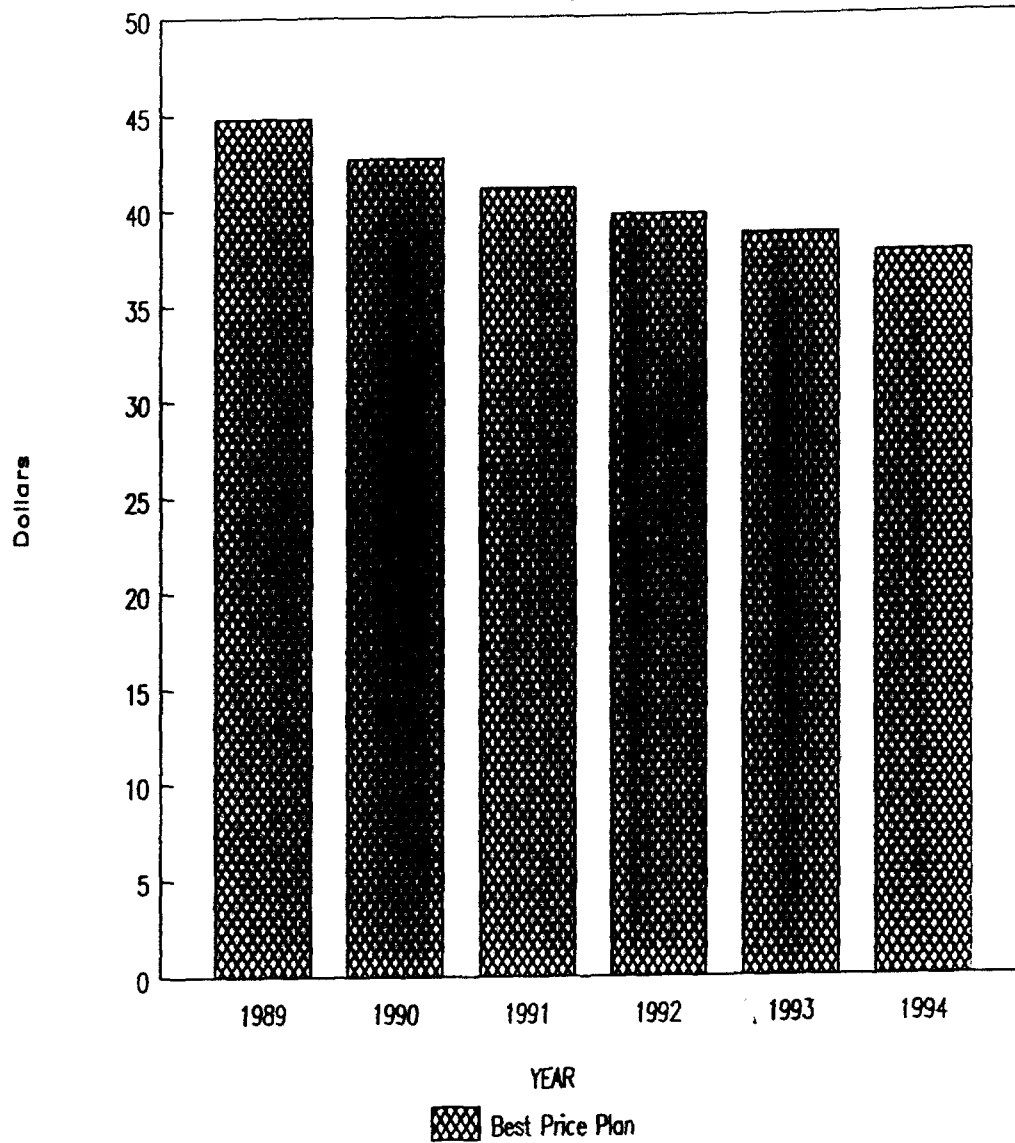
\* Effective Capacity is defined as bandwidth devoted to digital multiplied by the ratio of digital's advantage over analog plus bandwidth devoted to analog.

SOURCES: FCC, Second Report and Order; Charles River Associates.

ATTACHMENT B

# GTEM - CALIFORNIA

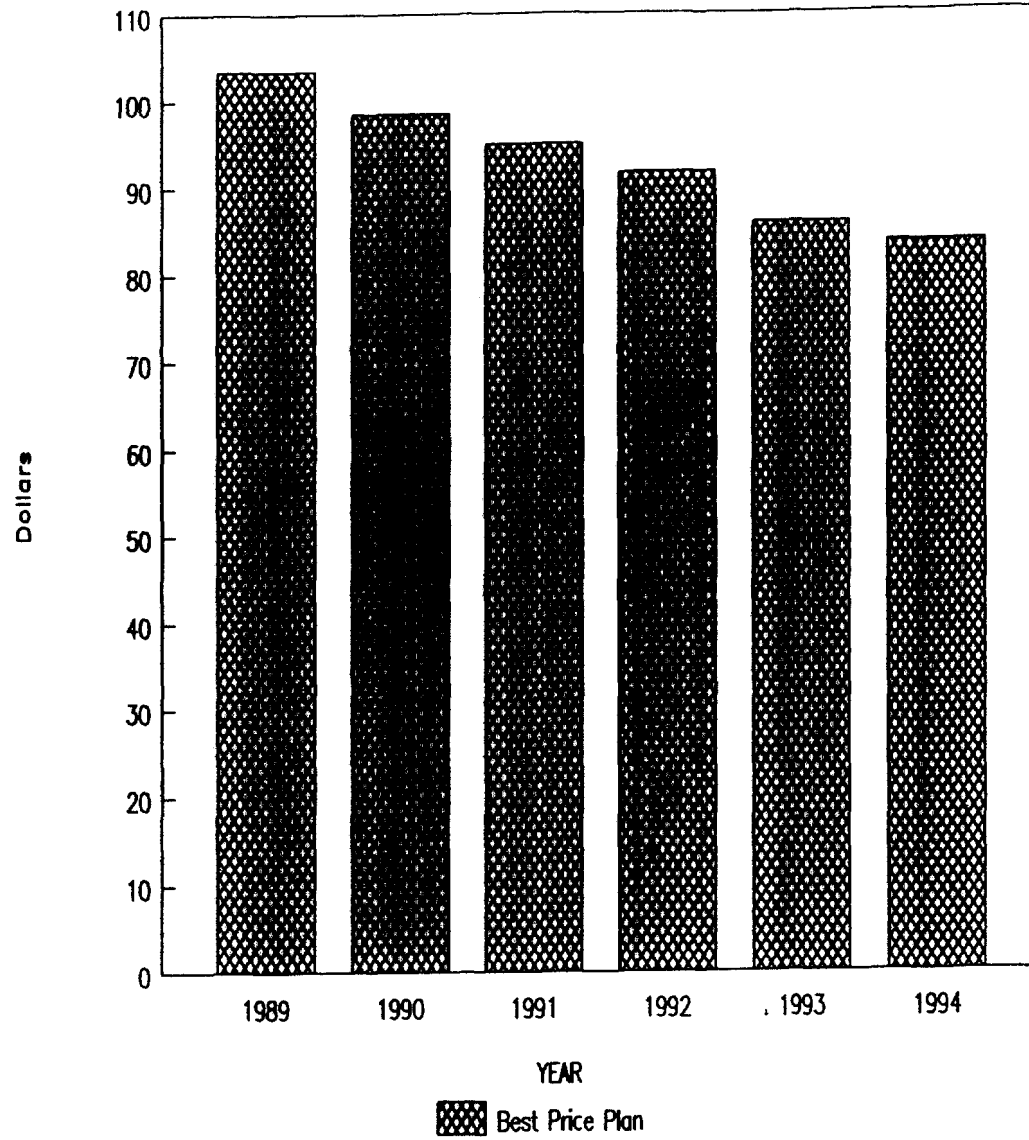
30 Minutes (1989 \$)





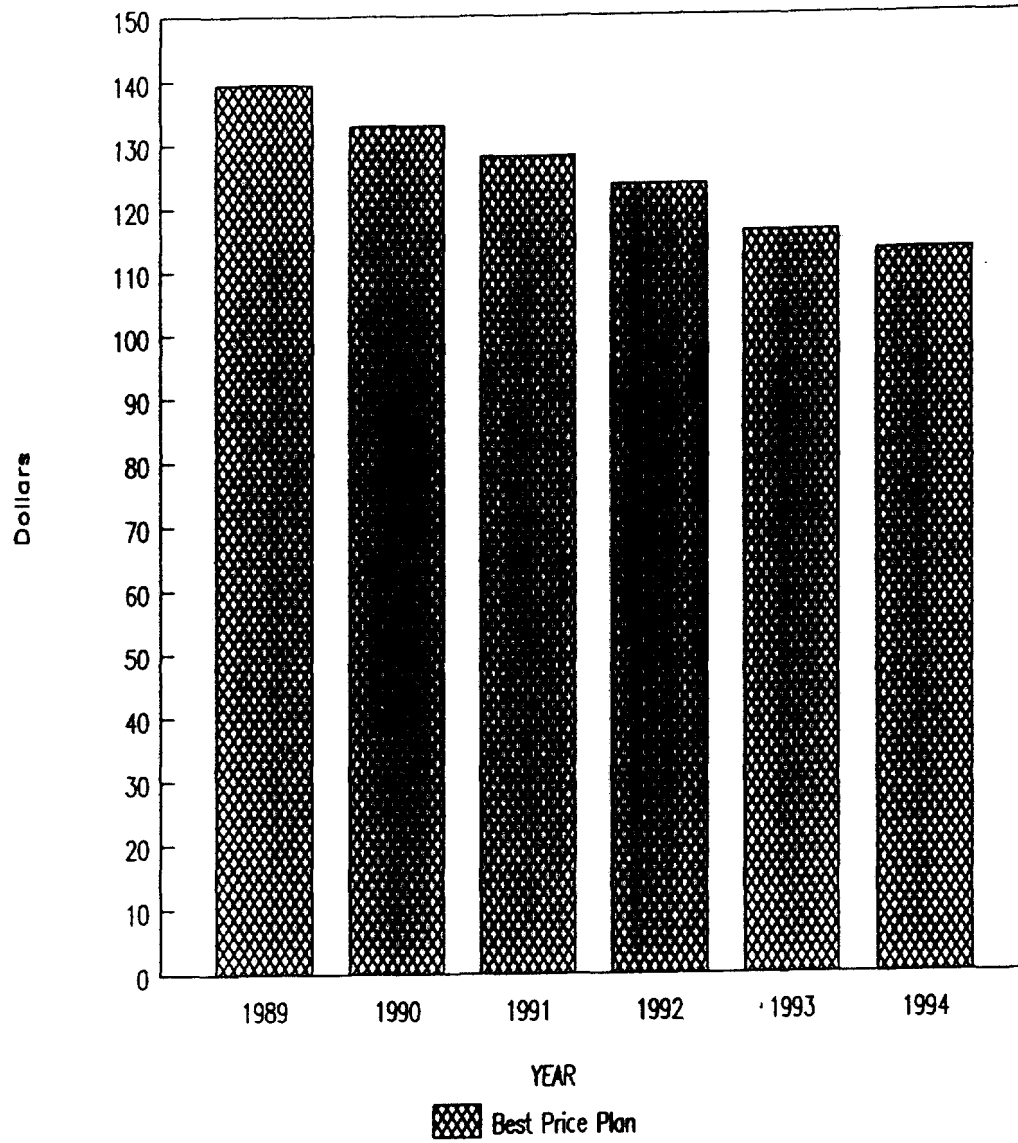
# GTEM - CALIFORNIA

160 Minutes (1989 \$)



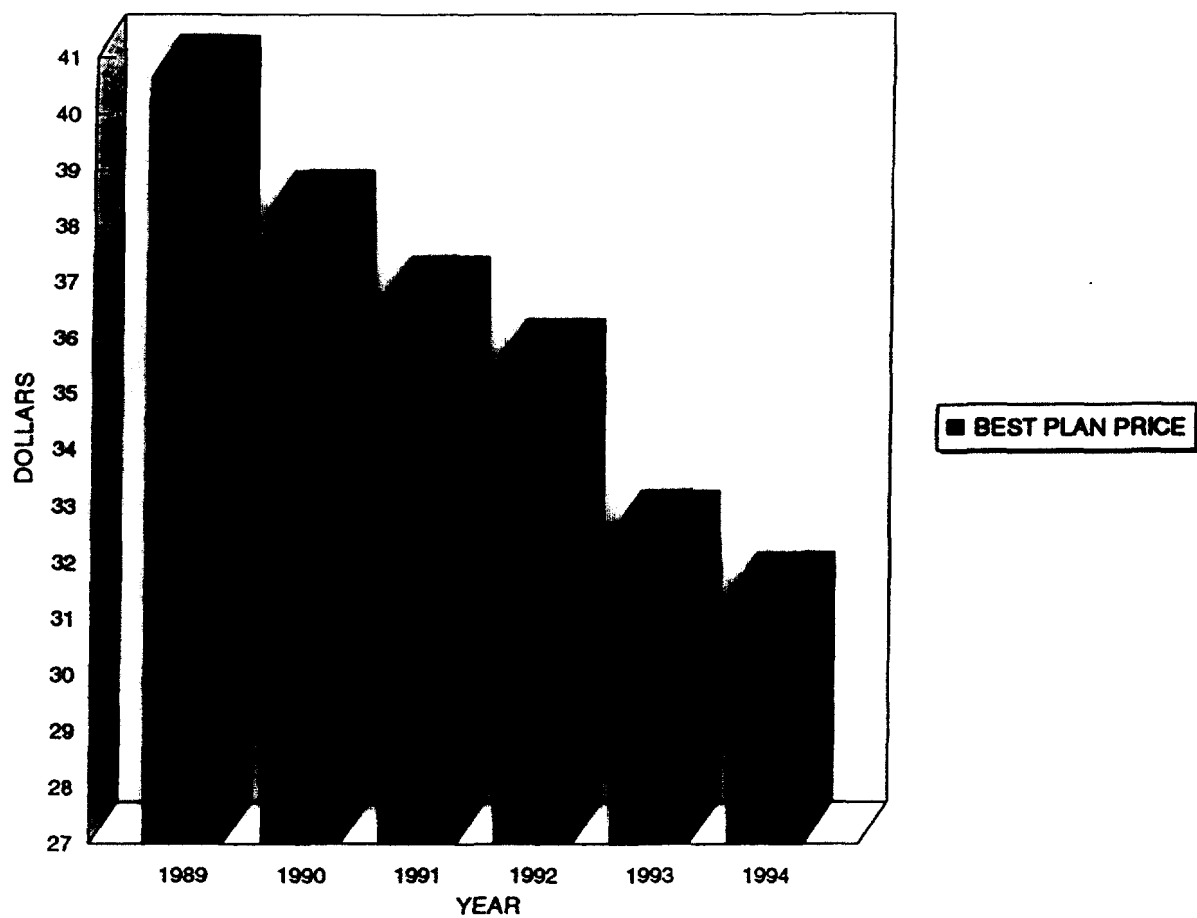
# GTEM - CALIFORNIA

250 Min. (1989 \$)



# CALIFORNIA

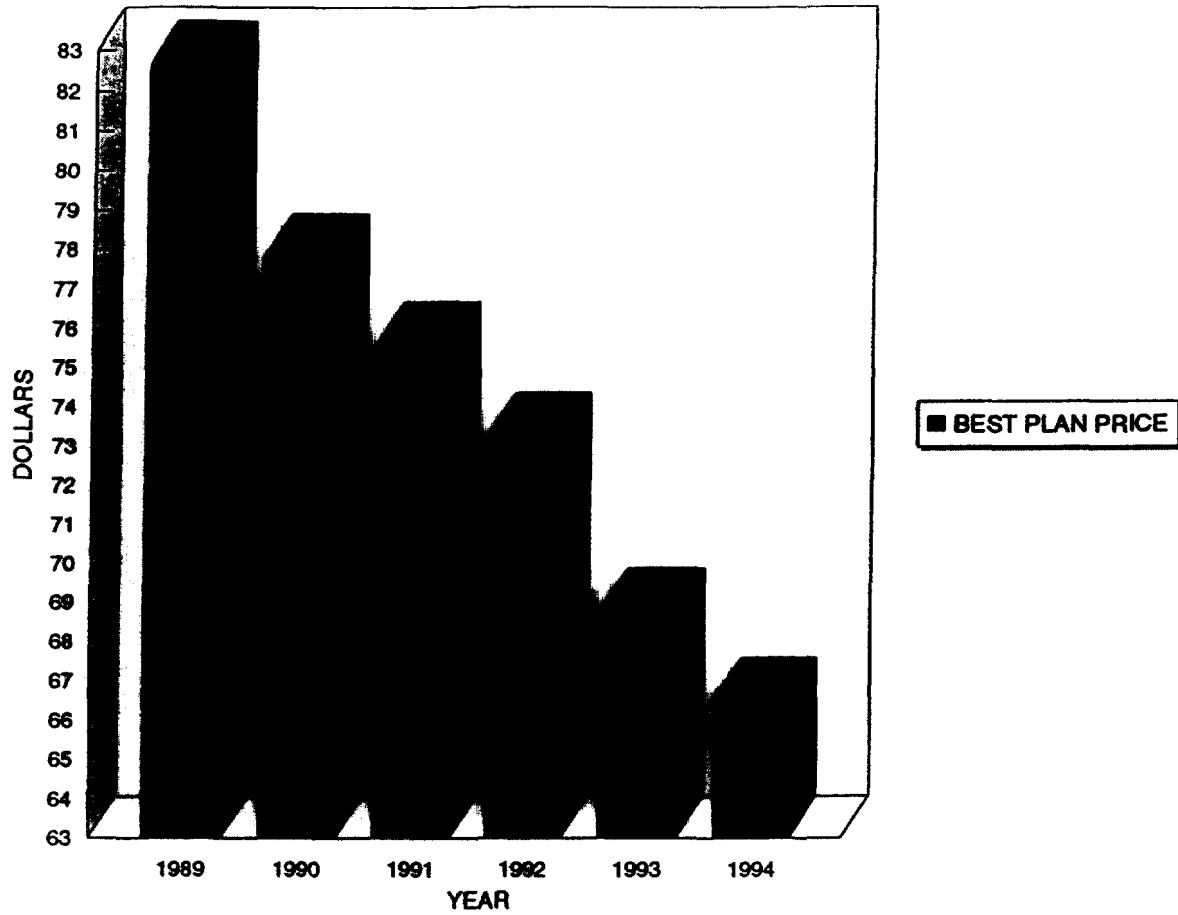
30 Minutes - Adjusted for Inflation



CONTEL CELLULAR, INC.

# CALIFORNIA

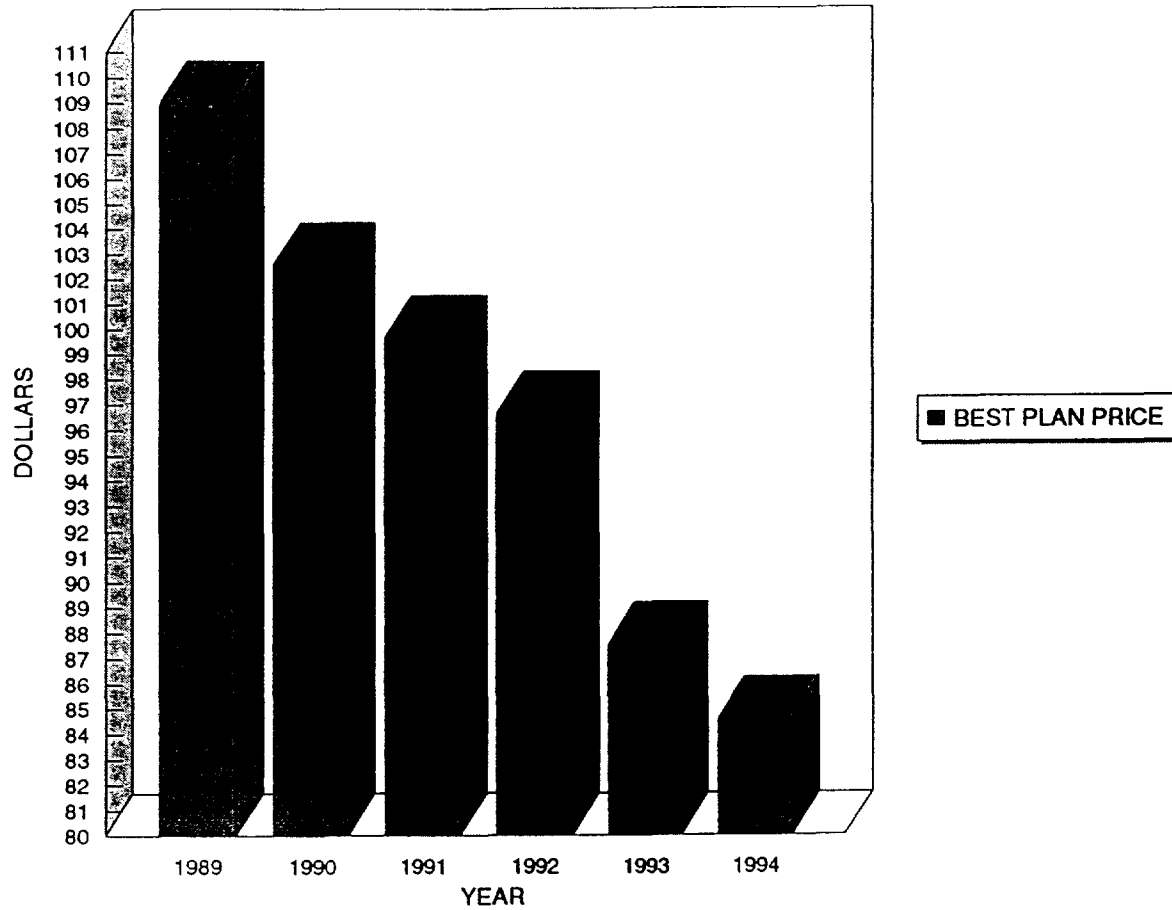
160 Minutes - Adjusted for Inflation



CONTEL CELLULAR, INC.

# CALIFORNIA

250 Minutes - Adjusted for Inflation



CONTEL CELLULAR, INC.

D E C L A R A T I O N

I, Philip L. Forbes, Director - Regulatory and Legislative Affairs for GTE Personal Communications Services, do hereby declare under penalty of perjury that I have read and foregoing "Comment of GTE Service Corporation, on behalf of its Telephone and Personal Communications Companies in Opposition to the Petition of the People of the State of California and the Public Utilities Commission of the State of California Requesting Authority to Regulate Rates Associated with the Provision of Cellular Service within the State of California" ("Comment"), that the Comment was prepared under my supervision and direction, and that the facts contained therein are true and correct to the best of my knowledge, information or belief.

9-19-94

DATE



Philip L. Forbes

**CERTIFICATE OF SERVICE**

I, Marnette Clemons, a secretary in the law firm of McFadden, Evans & Sill, do hereby certify that true copies of the foregoing "Comment of GTE Service Corporation, on behalf of its Telephone and Personal Communications Companies in Opposition to the Petition of the People of the State of California and the Public Utilities Commission of the State of California Requesting Authority to Regulate Rates Associated With the Provision of Cellular Service Within the State of California" were sent this 19th day of September, 1994, by first-class United States mail, postage prepaid, to the following:

Peter Arth, Jr., Esquire  
Edward W. O'Neill, Esquire  
Ellen S. Levin, Esquire  
505 Van Ness Avenue  
San Francisco, California 94102  
Attorneys for the People of the  
State of California and the  
Public Utilities Commission  
of the State of California

\*Mr. John Cimko, Chief  
Mobile Services Division  
Federal Communications Commission  
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\*By hand

  
Marnette Clemons